

REMARKS

The office action of 05/11/2004 has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1 through 8 remain in this case.

Preliminary Comments

Regarding Reference A in the instant Office Action, wherein the citation of "Labzelter" is not found. Upon contacting the Examiner, it is stipulated that wherever "Labzelter" occurs in the instant Office Action, it should be read and understood as --Berg--, which is cited in the Office Action with a U.S. PAT. NO. 3, ,845,694 associated therewith.

Rejection(s) under 35 U.S.C. §103

Claims 1,4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn et al. (5,184,578) in view of Berg (3,845,694).

The Office Action states as follows:

Regarding claims 1,4: Quinn discloses a variable cam timing phaser disposed between a first moving shaft and a second moving shaft, the phaser having a first end connected to the first moving shaft and a second end connected to the second moving shaft (see figure 3); a housing connected to the first end and a rotor connected to the second end, the rotor forming at least one vane disposed within the housing and dividing the housing into an advance chamber and a retard chamber, the vane being limited by at least one physical stop caused by an inside surface of the housing (see figure 11); the phaser being coupled to at least one check valve (see numerals 84,86); the phaser being further controlled by a feed back control loop having a control law, wherein an integrator accumulates a plurality of error signals resulting from the difference between a set point control signal and a feedback signal (see figure 1); the phaser further including a spool valve having a predetermined null position (see figure 11).

Quinn fails to disclose moving the spool valve just off the predetermined null position (either toward a retard or advance direction); permitting control fluid to flow at a substantially slow rate; and causing the **vane** to be positioned at a substantial distance away from the **physical stops**, thereby reducing noise caused by the vane coming in contact with the housing.

However, Labzelter teaches slowing **end of stroke motion** to reduce shocks/damage by cushioning effect through **restriction of fluid discharge** (see abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the motion of the spool valve as taught by Quinn

to that of restriction of fluid discharge as taught by Labzelter in order to avoid the shock as taught by Labzelter.

With regard to the Labzelter reference, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In the instant application, the reference to Labzelter addresses substantially the same problem faced by the instant inventor, and solves such problem substantially as claimed. Moreover, the cushioning of fluid actuators is equally germane to rotary and reciprocating members. (emphasis added)

Claim 1 recites:

In a variable cam timing phaser disposed between a first moving shaft and a second moving shaft, the phaser having a first end connected to the first moving shaft, and a second end connected to the second moving shaft; a housing connected to the first end and a rotor connected to the second end, the rotor forming at least one vane disposed within the housing and dividing the housing into an advance chamber and a retard chamber, the vane being limited by at least one physical stop caused by an inside surface of the housing; the phaser being coupled to at least one check valve; the phaser being further controlled by a feed back control loop having a control law, wherein an integrator accumulates a plurality of error signals resulting from the difference between a set point control signal and a feedback signal; the phaser further including a spool valve having a predetermined null position; a method involving the phaser comprising:

moving the **spool valve** just off the predetermined **null position**;

permitting control fluid to flow at a **substantially slow rate**; and

causing **the vane** to be positioned at a **substantial distance** away from the physical stops, thereby reducing noise caused by the vane coming in contact with the housing. (Emphasis added)

With regard to the above cited instant Office Action's remarks on Quinn, the Examiner is merely addressing the preamble of claim 1. Furthermore, the Examiner has admitted that **Quinn fails to disclose moving the spool valve just off the predetermined null position (either toward a retard or advance direction)**; permitting control fluid to flow at a substantially slow

rate; and causing the **vane** to be positioned at a substantial distance away from the **physical stops**, thereby reducing noise caused by the vane coming in contact with the housing.

With regard to Berg, which teaches a compact valve assembly rapidly slows **end of stroke motion** of the piston of a hydraulic cylinder to reduce shocks and the risk of damage to the cylinder or mechanisms operated thereby. A cushioning effect, by **restriction of fluid discharge**, and a bypass effect, by **lowering of driving fluid pressure**, is provided at one end of the piston travel while a bypass effect only is provided at the other end of the piston movement.

Further, nowhere in Berg is the “moving the **spool valve** just off the predetermined **null position**” taught or suggested. Similarly, “permitting control fluid to flow at a **substantially slow rate**” and “causing **the vane** to be positioned at a **substantial distance away** from the physical stops, thereby reducing noise caused by the vane coming in contact with the housing” are NOT taught or suggested by Berg either.

For example, nowhere is the concept and implementation of the **null position** taught or suggested in Berg, in that the null position is associated with a vane position anywhere within a housing cavity, wherein there is virtually no control fluid flow. Whereas on the other hand, Berg is merely teaching teaches a compact valve assembly rapidly slows **end of stroke motion** of the piston of a hydraulic cylinder to reduce shocks and the risk of damage to the cylinder.

Because at least the highlight limitations of claim 1 are NOT taught or suggested by Berg alone or in combination with Quinn, the rejection is deemed overcome.

Combining Quinn and Berg will NOT yield claim 1 in that the resultant combination of Quinn and Berg will yield a phaser claimed in the preamble with teaches a compact valve assembly rapidly slows **end of stroke motion** of the piston of a hydraulic cylinder to reduce shocks and the risk of damage to the cylinder or mechanisms operated thereby having a cushioning effect. This is NOT moving the **spool valve** just off the predetermined **null position**; permitting control fluid to flow at a **substantially slow rate**; and causing **the vane** to be positioned at a **substantial distance away** from the physical stops, thereby reducing noise caused by the vane coming in contact with the housing.

With regard to dependent claims 2-8, by virtue of their dependency, are deemed patentable as well.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn in view of Berg as applied to claim 1 above, and further in view of Simpson et al. (6,247,434).

See supra, claim 2 by virtue of their dependency, are deemed patentable as well.

Claims 3,7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quinn in view of Berg as applied to claim 1 above, and further in view of Gardner et al. (US2003/0033999).

See supra, claim 3 by virtue of their dependency, are deemed patentable as well.

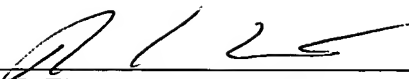
Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

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